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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,627	06/20/2001	Chris P. Calkins	A019	4531

23623 7590 12/17/2003

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CLEVELAND, OH 44114

EXAMINER

PAK, SUNG H

ART UNIT PAPER NUMBER

2874

DATE MAILED: 12/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n No.	Applicant(s)	
	09/885,627	CALKINS ET AL.	
	Examiner	Art Unit	
	Sung H. Pak	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's response filed 9/29/2003 has been carefully studied by the examiner. All the arguments regarding the patentability of the pending claims have been reviewed, however they are not convincing. The ground of claim rejection provided in the previous office action is upheld by the examiner in this office action. Please refer to Response to Arguments for further details.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitwalsky et al (US 5,789,302) in view of Doerr (US 6,219,471 B1) as stated in the previous office action.

Mitwalsky et al reference discloses a method of dicing a substrate and a structure including all the limitations set forth in the claims, except it does not teach the cutting of the wafer in a curvilinear manner. Specifically Mitwalsky et al reference discloses: providing a wafer comprising integrated circuits ("214", "216" Fig. 2); forming crack stops in the wafer, each crack stops disposed adjacent and parallel to integrated circuits ("250" Fig. 2); cutting the wafer to yield plurality of separated integrated circuits (column 1 lines 61-67).

Regarding claims 3-4, 19-20, Mitwalsky et al reference teaches formation of crack stops by removing portion of the wafer substrates (column 3 lines 6-12).

Regarding claim 12, Mitwalsky et al reference teaches crack stops being composed of hard and soft passivation layers (column 2 lines 60-62).

Regarding claims 5, 10, Mitwalsky et al reference teaches forming crack stops by chemical etching (column 3 lines 19-27).

Regarding claims 16, Mitwalsky et al reference teaches the use of silicon dioxide substrates (column 2 line 53).

On the other hand, Doerr reference teaches cutting the optical device substrates in a curvilinear manner to form curved optical integrated circuits (Fig. 3-4). Doerr explicitly teaches that such a configuration is advantageous over the prior art because it provides for low polarization sensitivity (abstract). Therefore, it would have been

obvious to a person of ordinary skill in the art at the time the invention was made to modify Mitwalsky et al invention to have optical integrated circuits cut in a curvilinear manner. It would have been desirable to have efficient optical integrated circuit devices.

Response to Arguments

Starting on page 2, paragraph 4 of the applicant's response, it is first argued that "the combination of Mitwalsky et al and Doerr does not teach or suggest all of the features of the claimed invention." Specifically, it is argued that even though Doerr reference does describe curvilinear waveguides, it "does not describe, teach, or suggest curvilinear cutting."

The examiner respectfully disagrees. Doerr reference discloses an optical circuit element, specifically a planar wavelength division multiplexing circuit (WDM) having curvilinear optical waveguides well known in the optical device art (column 1 line 10-column 2 line 47). Although the reference does not explicitly state steps of cutting the curvilinear waveguides, this is inherent in the manufacture of such a planar WDM device. Even the applicant own disclosure (in the Background of the Invention section) states that such a cutting in planar lightwave circuit is known in the art (page 1 paragraph 3). Therefore, Doerr reference fully anticipates cutting of planar optical waveguides. Thus, while it is true that neither Mitwalsky et al nor Doerr reference *individually* discloses all the claimed limitation, the references *combined together* discloses all the features of the claimed invention.

Second, it is argued that Mitwalsky et al reference discloses a “semiconductor integrated circuit chips, not optical integrated circuits” and that because semiconductor circuits are smaller than optical circuits, this “difference in size would motivate one skilled in the art NOT to employ curvilinear cutting on the wafer...”

The examiner respectfully disagrees. As stated in the previous and this office action, Mitwalsky et al reference discloses formation of crack stops and steps of cutting silicon or silicon dioxide wafers as required by claims 1-22 (especially claim 16) of the instant application (column 2 lines 52-54). Such silicon and silicon dioxide wafers exhibit optical characteristics, as also recognized by the applicant's own disclosure. Even if we assume that silicon wafers of Mitwalsky et al are indeed smaller than planar WDM circuits, applicant's argument that this would motivate one skilled in the art NOT to employ curvilinear cutting, is not convincing.

Applicant states “This difference in size would motivate one skilled in the art NOT to employ curvilinear cutting on the wafer... because cracking would surely occur when making tight, small radial cuts in a brittle material such as silicon.” However, this is precisely why Mitwalsky et al reference teaches a formation of crack stops. Crack stops formed in accordance with the teaching of Mitwalsky et al reference would prevent brittle silicon wafers from cracking during the cutting process. Therefore, it is not convincing that this difference in size would motivate one NOT to employ curvilinear cutting.

There having been no other outstanding arguments regarding the patentability of the pending claims, the examiner upholds the previous ground of rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (703) 308-4880. The examiner can normally be reached on Monday - Thursday : 6:30am-5:00pm.

The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

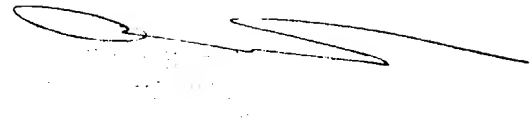
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Sung H. Pak
Examiner
Art Unit 2874

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